The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1.   A method for operating a vision system to determine a set of coordinates for a plurality of edge points along an edge contour of an object, wherein the plurality of edge points extend over a depth range greater than the depth of field of an image of the edge contour, the method comprising:

determining the coordinates for at least a latest previous edge point in at least a latest previous edge point image;

automatically determining a next edge point XY trial location based at least partially on the XY location of the latest previous edge point;

determining a desired next edge point source image based on the next edge point XY trial location and previously acquired data;

searching for the next edge point in the desired next edge point source image.

2.   The method of Claim 1, wherein the previously acquired data comprises a plurality of images acquired at a plurality of corresponding focus positions and the step of determining a desired next edge point source image comprises selecting the one of the plurality of images that is determined to have the best focus in the vicinity of the next edge point XY trial location.

3.   The method of Claim 1, wherein the previously acquired data comprises the determined coordinates for the latest previous edge point and for a previous edge point before the latest previous edge point, and the step of determining a desired next edge point source image comprises:

determining an estimated Z coordinate in the vicinity of the next edge point XY trial location; and

acquiring a desired next edge point source image at a focus position based on the estimated Z coordinate.

4.   The method of Claim 3, wherein the step of determining an estimated Z coordinate in the vicinity of the next edge point XY trial location comprises:

determining a line through the determined coordinates for the latest previous edge point and the previous edge point before the latest previous edge point; and

determining an extrapolated Z coordinate on the line in the vicinity of the next edge point XY trial location.

5.   The method of Claim 1, wherein the previously acquired data comprises a plurality of images acquired at a plurality of corresponding focus positions and the step of determining a desired next edge point source image comprises:

determining a focus characterization in the vicinity of the next edge point XY trial location for at least some of the plurality of images;

fitting a curve to the determined focus characterizations as a function of the corresponding focus positions;

determining a best focus position corresponding to a peak of the fitted curve; and

acquiring a desired next edge point source image based on the determined best focus position.

6.   The method of Claim 5, wherein the focus characterization comprises a contrast value.

7.   The method of Claim 6, wherein the contrast value comprises a peak-gradient value determined along a scan line in the at least some of the plurality of images.

8.   The method of Claim 7, wherein the same scan line location is used in the step of searching for the next edge point in the desired next edge point source image.

9.   The method of Claim 8, wherein the same peak-gradient value is used in the step of searching for the next edge point in the desired next edge point source image.

10.   The method of Claim 1, wherein the step of determining a desired next edge point source image comprises:

determining a desired next edge point focus position based on the next edge point XY trial location and the previously acquired data; and

determining a desired next edge point source image based on the desired next edge point focus position.

11.   The method of Claim 1, wherein the previously acquired data comprises the Z coordinate for the latest previous edge point, and the step of determining a desired next edge point source image comprises:

determining a plurality of focus positions based at least partially on the Z coordinate for the latest previous edge point;

acquiring a plurality of images corresponding to the determined plurality of focus positions and including the next edge point XY trial location; and

determining a desired next edge point source image based on the acquired plurality of images.

12.   The method of Claim 1, wherein when the step of searching for the next edge point in the desired next edge point source image determines the coordinates of the next edge point, the method further comprises:

the just-determined next edge point becomes the latest previous edge point;

the desired next edge point image becomes the latest previous edge point image; and

the method iteratively continues with the step of automatically determining a next edge point XY trial location.

13.   The method of Claim 1, wherein the step of searching for the next edge point in the desired next edge point source image comprises:

performing at least one edge detection operation along a scan line spaced at a present scan line sample interval from the latest previously determined edge point and coinciding with the next edge point XY trial location in the desired next edge point source image.

14.   The method of Claim 13, wherein if the at least one edge detection operation along a scan line coinciding with the next edge point XY trial location fails to detect an edge point, a new scan line is defined spaced at one half of the present scan line sample interval from the latest previously determined edge point, and a new next edge point XY trial location is established coinciding with the new scan line, and the second determining step and the searching step are repeated.

15.   The method of Claim 14, wherein when the one half of the present scan line sample interval is less than a predetermined minimum scan line sample interval, the searching step further comprises:

defining a new scan line sample interval larger than the present scan line sample interval; and

performing edge detection operations along scan lines determined in multiple directions that are tangential to a circular pattern that is centered around the latest previously determined edge point and that has a radius equal to the new scan line sample interval, until an edge point is detected.

16.   The method of Claim 1, wherein the method is employed for operating a vision system during a learn mode of operation.

17.   The method of Claim 1, wherein the method is employed for operating a vision system during a run mode of operation.